

REMARKS/ARGUMENTS

Claims 1-147 are pending in the application; the status of the claims is as follows:

Claims 1-17, 29-37, 39, 41, 43, 45, 47, 49, 51, 53, and 55-130 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a non-elected species.

Claims 18-28, 38, 40, 42, 44, 46, 48, 52, and 54 are rejected under the second paragraph of 35 U.S.C. § 112 as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention.

Claim 18 is rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,437,811 to Doane et al. (“Doane”).

Claims 18, 23, 24, and 26-28 are rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,320,639 B1 to Mori et al. (“Mori”), considered with the Lu et al. article “13.3 Surface Modified Reflective Cholesteric Displays” (“Lu”).

Claims 131-147 are added by this Amendment. Claims 131-147 are directed to the elected species and do not constitute new matter.

The indication that the Examiner has no objections to the drawings filed with the application is noted with appreciation.

Claims 18, 20-28, 38, 40, 42, 44, 46, 48, 52, and 54 have been amended to more particularly point out and distinctly claim the subject matter of the invention. These changes do not introduce any new matter.

35 U.S.C. § 112 Rejection

The rejection of claims 18, 20-28, 38, 40, 42, 44, 46, 48, 52, and 54 under the second paragraph of 35 U.S.C. § 112 as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention, is respectfully traversed based on the following.

Each of claims 18-28, 38, 40, 42, 44, 46, 48, 50, 52, and 54 have been amended to more particularly point out and distinctly claim the subject matter of the invention.

Accordingly, it is respectfully requested that the rejection of claims 18-28, 38, 40, 42, 44, 46, 48, 52, and 54 under the second paragraph of 35 U.S.C. § 112 as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention, be reconsidered and withdrawn.

35 U.S.C. § 102(b) Rejection

The rejection of claim 18 under 35 U.S.C. § 102(b) as being anticipated by Doane, is respectfully traversed based on the following.

A polydomain state, as required by claim 18, is defined in the specification on page 93, paragraph [0277]. A polydomain state includes numerous domains, each with their helical axis slightly inclined with respect to the substrate normal, the direction of the helical axis of one domain being random with respect to the directions of the helical axes of the other domains. The concept of a polydomain is illustrated in FIG. 11 of the application, which shows the direction of the helical axis to be inclined at angles of perhaps 10 degrees or less.

In contrast, the indicated portion of Doane discloses a polymer domain, not a polydomain. The disclosed polymer domain, as shown in FIGs. 4 and 5 of Doane, show either all of the domains to be normal to the surface of the substrate (FIG. 4), or at angles of 45 degrees or more, some domains are even parallel to the substrate. As such, Doane clearly does not disclose a helical axis direction that is slightly inclined as required by claim 18 and defined in the specification.

Further, even if Doane did disclose slightly inclined helical axis directions, which it does not, Doane does not disclose pixel regions having liquid crystal domains in both polydomain and monodomain states. For at least these reasons (no polydomain and no

pixel region including both polydomain and monodomain states), Doane cannot anticipate claim 18.

Accordingly, it is respectfully requested that the rejection of claim 18 under 35 U.S.C. § 102(b) as being anticipated by Doane, be reconsidered and withdrawn.

35 U.S.C. § 102(e) Rejections

The rejection of claims 18, 23, 24, and 26-28 under 35 U.S.C. § 102(e) as being anticipated by Mori, considered with Lu is respectfully traversed based on the following.

The Office Action notes that FIG. 15 and the corresponding text show a mixed state of both polydomains (region F) and monodomains (region G). While FIG. 15 does disclose a mixed state, it is not the pixel region as required by claim 18. Region F is shown to be adjacent element 58a, a low-resistivity metal electrode. Column 19, lines 12-13 indicate such low-resistivity metal electrodes are formed of Al (aluminum). As aluminum is not transparent, that portion of the device cannot be considered to be a pixel or display region. The low-resistivity metal electrodes thus form a non-transparent border between pixels. The actual pixel or display portion of the device, where light is modulated, is only that portion indicated by G. As found in column 19, lines 33-43, and as noted in the Office Action, the region denoted G is a monodomain having a prescribed tilt angle, i.e., a homeotropic alignment state. For this reason, Mori clearly does not disclose a pixel region having both a polydomain state and a monodomain state, and thus cannot anticipate claim 18.

The Office Action uses Lu for the proposition that a rough surface, such as region F, would inherently cause liquid crystal material to have a polydomain state. As Mori does not disclose a pixel region having both a polydomain state and a monodomain state, whether a rough surface would inherently cause a polydomain state is immaterial. Thus, the combination of Mori and Lu does disclose each element of claim 18 and cannot anticipate claim 18.

Claims 23, 24, and 26-28 depend, either directly or indirectly from claim 18. As claim 18 is considered unanticipated and non-obvious over the combination of Mori and Lu, claims 23, 24, and 26-28 are considered unanticipated and non-obvious for at least the same reasons.

In addition, claims 23, 24, and 26-28 disclose additional limitations not disclosed or suggested by the combination of Mori and Lu. The Office Action asserts that Mori discloses a rubbing process performed by emitting light under predetermined conditions to the orientation control layer. Mori discloses several processing steps in the fabrication of a liquid crystal device that use light, but does not disclose a rubbing process that uses light. The first light process in Mori is found in column 11, line 59 to column 12, line 16. This first light process uses light to create the color filters 4 and the shade layer 9. That the light process is not a rubbing process is found specifically in column 12, line 15 which state the alignment film 6 “was then rubbed in one direction,” i.e., the light process was prior to the rubbing process. Column 14, lines 7-20 of Mori disclose a scanning UV light process. This scanning process is conducted “along a center of a pixel-spacing,” i.e., it defines the boundary between adjacent pixels corresponding to region F. As the orientation control layer in the present application is on the substrate having liquid crystal domains in mixed states in the pixel regions, Mori’s UV scanning process to define pixel boundaries is inapplicable. That the scanning UV process is for defining pixel boundaries is clear from column 15, lines 6-12 of Mori which states the process makes it possible “to prevent the liquid crystal 17A at the pixel-spacing region from being driven in response to an electric field.” The single rubbing process disclosed by Mori is at column 13, line 61 through column 14, line 6, which states “[t]he rubbing may for example be performed by rotating a rubbing roller comprising a 5 cm-dia., core roller about which a rubbing cloth comprising a yarn of nylon 66 having yarn length of 4 mm is wound.” Thus, Mori discloses only a mechanical rubbing process, not a light-based rubbing process.

The Office Action indicates column 18, lines 4-16 of Mori disclose a light-based rubbing process. The indicated section actually teaches a method of protecting a portion of the substrate from the rubbing process. A layer of resist is patterned such that it

remains on the outside pixel region before rubbing. The part then undergoes the disclosed mechanical rubbing process. The purpose of the resist is thus to protect the underlying portion of the substrate from the mechanical rubbing process as the resist would be mechanically rubbed rather than the underlying substrate. Therefore, Mori does not disclose or suggest a rubbing process using an emitting light as required by claim 26, and therefore cannot anticipate or render obvious the device of claim 26. Further, Lu similarly does not disclose or suggest the use of a rubbing process using an emitting light. Thus, the combination of Mori and Lu cannot anticipate or render obvious the device of claim 26.

Claims 27 and 28 provide further limitations on a rubbing process that uses an emitting light. As the combination of Mori and Lu does not disclose or suggest a light-based rubbing process, Mori and Lu cannot anticipate or render obvious the devices of claims 27 and 28.

Accordingly, it is respectfully requested that the rejection of claims 18, 23, 24, and 26-28 under 35 U.S.C. § 102(e) as being anticipated by Mori, considered with Lu, be reconsidered and withdrawn.

CONCLUSION

Wherefore, in view of the foregoing amendments and remarks, this application is considered to be in condition for allowance, and an early reconsideration and a Notice of Allowance are earnestly solicited.

This Amendment increases the number of independent claims by 5 from 14 to 19 and increases the total number of claims by 17 from 130 to 147, but does not present any multiple dependency claims. Accordingly, a Response Transmittal and Fee Authorization form authorizing the amount of \$736.00 to be charged to Sidley Austin Brown & Wood LLP's Deposit Account No. 18-1260 is enclosed herewith in duplicate. However, if the Response Transmittal and Fee Authorization form is missing, insufficient, or otherwise inadequate, or if a fee, other than the issue fee, is required during the pendency of this

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application, please charge such fee to Sidley Austin Brown & Wood LLP's Deposit Account No. 18-1260.

Any fee required by this document other than the issue fee, and not submitted herewith should be charged to Sidley Austin Brown & Wood LLP's Deposit Account No. 18-1260. Any refund should be credited to the same account.

If an extension of time is required to enable this document to be timely filed and there is no separate Petition for Extension of Time filed herewith, this document is to be construed as also constituting a Petition for Extension of Time Under 37 C.F.R. § 1.136(a) for a period of time sufficient to enable this document to be timely filed.

Any other fee required for such Petition for Extension of Time and any other fee required by this document pursuant to 37 C.F.R. §§ 1.16 and 1.17, other than the issue fee, and not submitted herewith should be charged to Sidley Austin Brown & Wood LLP's Deposit Account No. 18-1260. Any refund should be credited to the same account.

Respectfully submitted,

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